Wyoming Rangeland Exclosures

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Current exclosure research

- Jen Boyle & Hild, biological soil crusts, soil chemistry, and vegetative cover
- Craig Smith & Rich Olson, small mammals
- Pete Stahl, L. Munn, A. Hild & students, below-ground biology and soil chemistry
- Others, soil carbon, hydrology & erosion

Why build exclosures?

- provide a standard
- “rangeland reference areas”

Exclosures in Wyoming

- in 1950s Fisser began fencing exclosures in Wyoming
  - 140 established
  - many now >35 years old
- Since that time, BLM, FS added new
  - up to 240 now in Wyoming

Limitations of exclosures

- assumes native vegetation recovers with removal of grazing
- most already grazed prior to exclosure
- variability in historic conditions
- woody plant dominance
- presence of exotics

Exclosures can demonstrate:

- ecosystem response to removal of domestic animals after historic grazing
- how exotics may invade

removal of grazing from shrublands

- woody plants may have competitive advantage following grazing
- shrub canopy cover may increase
- seedling recruitment of shrub species may depend on moisture regimes

Exotic invasions in exclosures

- Are exotics present in exclosures?
- When did they enter?
- Does a particular vegetation type favor exotics?

First: are early exclosures intact?

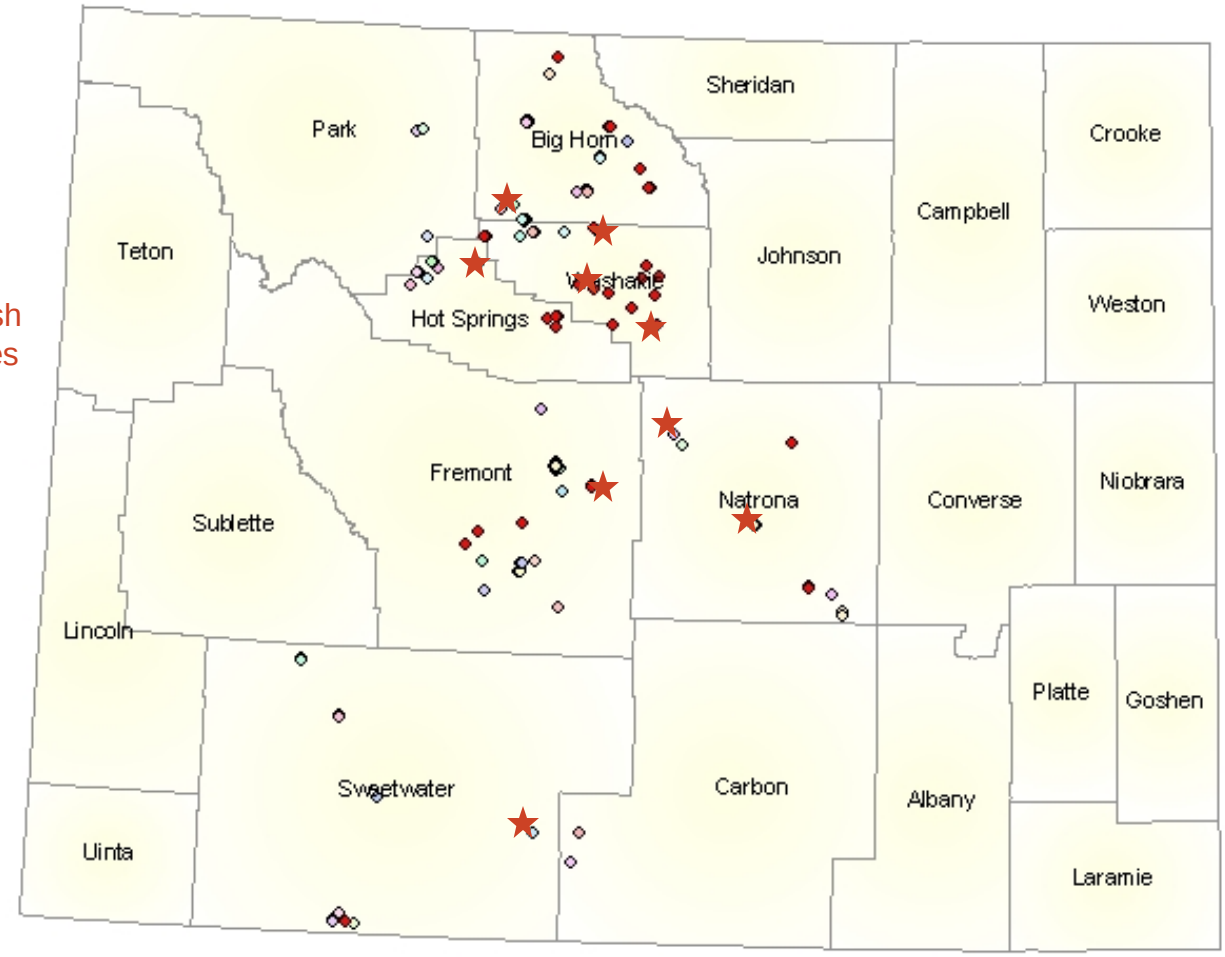
- find old records to revisit sites
- evaluate integrity of exclosures
- complete a checklist of qualities

New Exclosure records

- summer 2002, revisit 85 exclosures
- checklist
  - gps coordinates
  - fence integrity
  - photos
  - dominant vegetation
  - signs of disturbance & use
  - weed invasions
- Access database

85 Exclosures visited in 2002

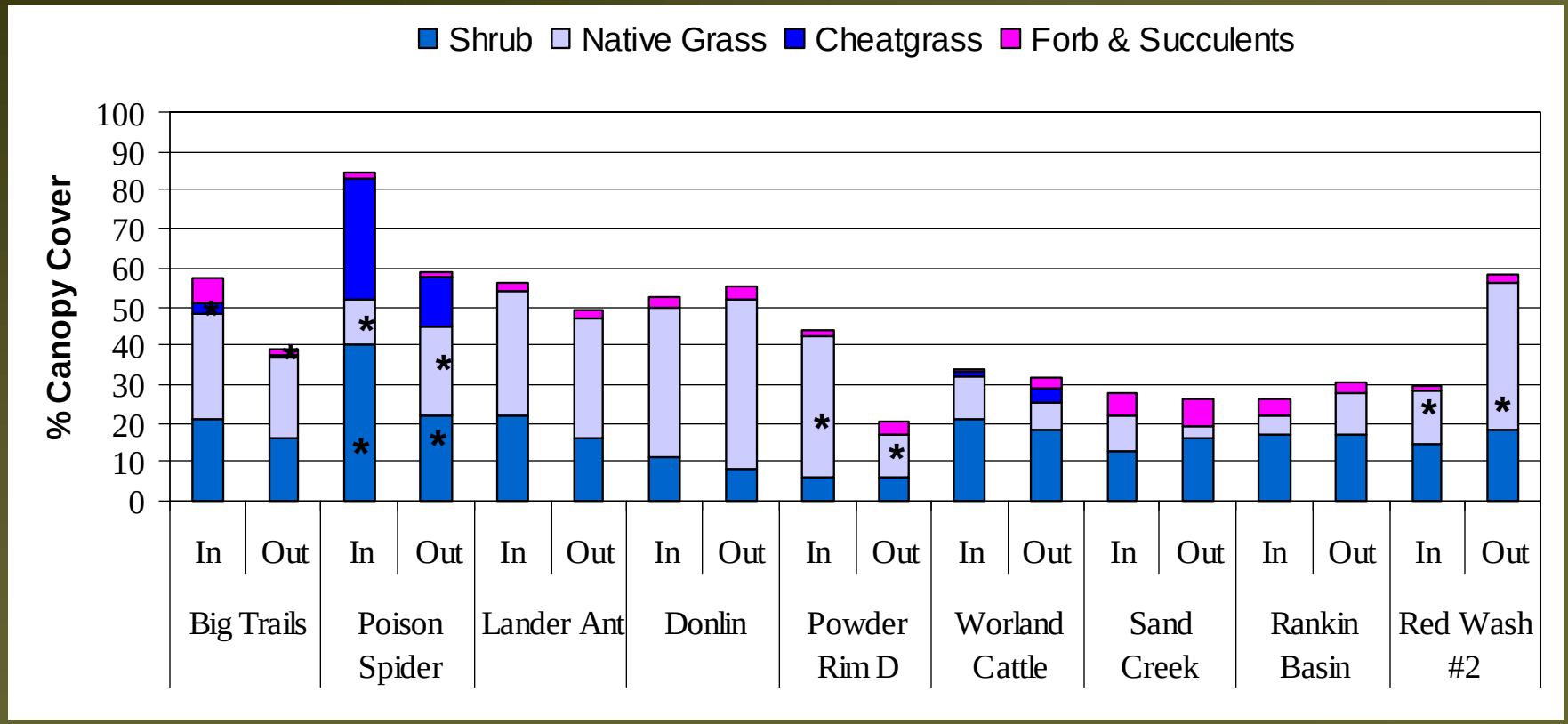
★ Sagebrush study sites



Select sagebrush exclosures

- selected nine for more intensive sampling
- wide range of moisture availability
- soil, vegetation, and biotic soil crust monitoring

Vegetative cover at 9 sagebrush sites.



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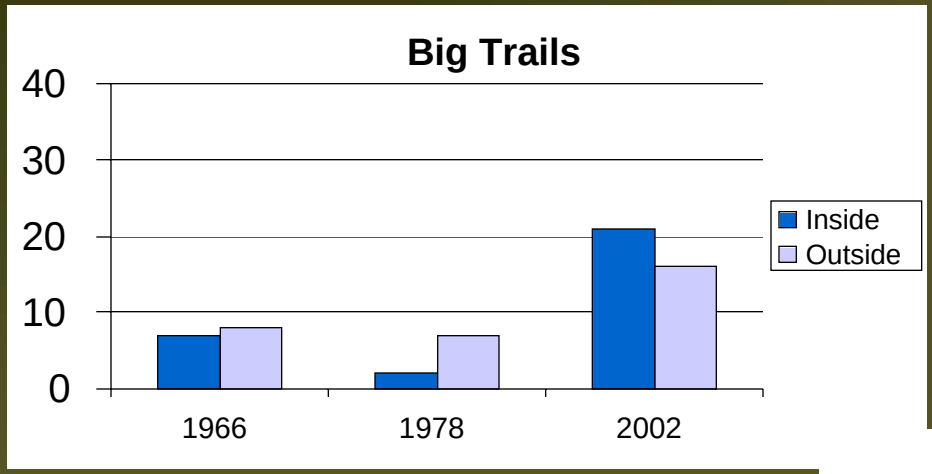
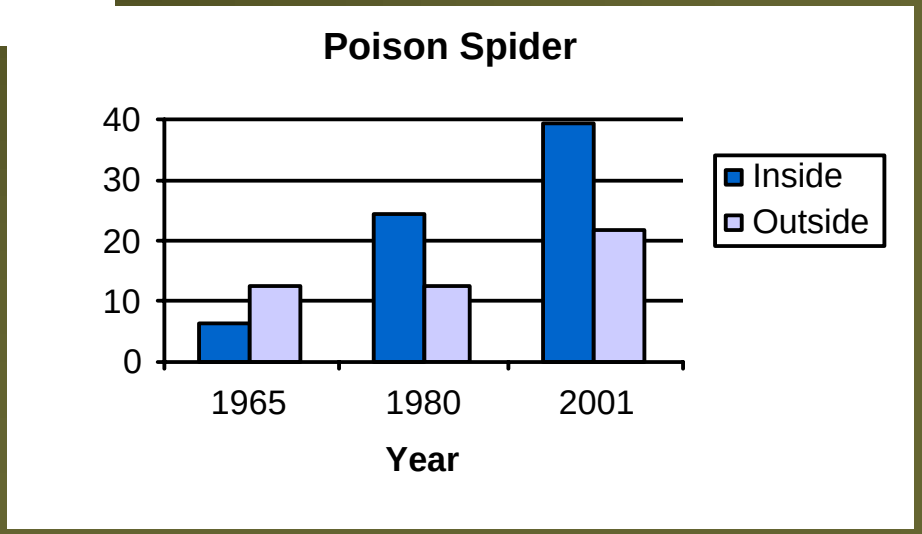
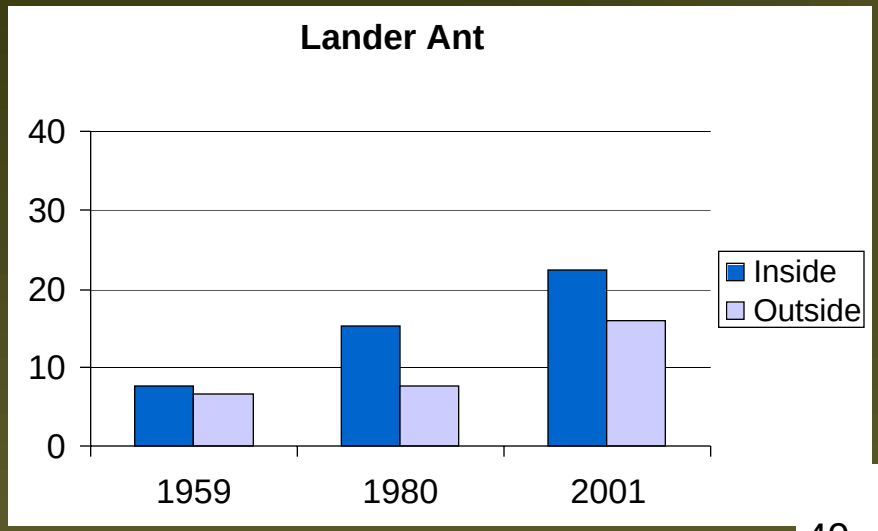
Shrub cover (%)



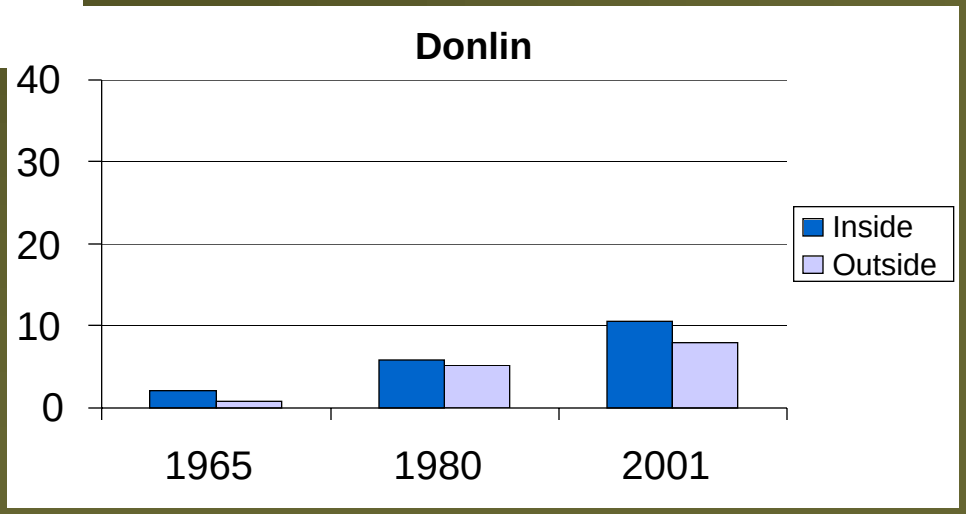
exclosures with Brte



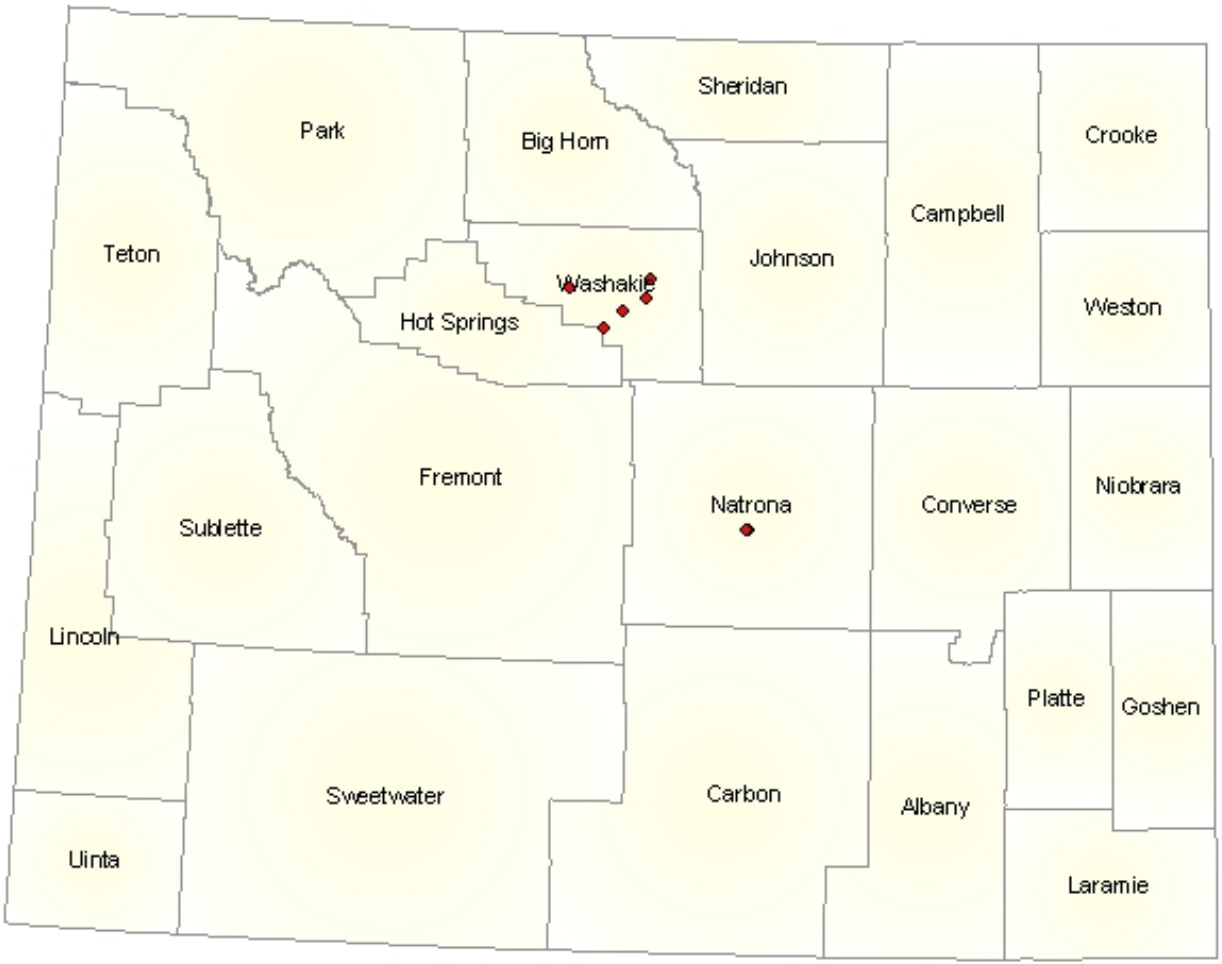
Shrub Cover (%)



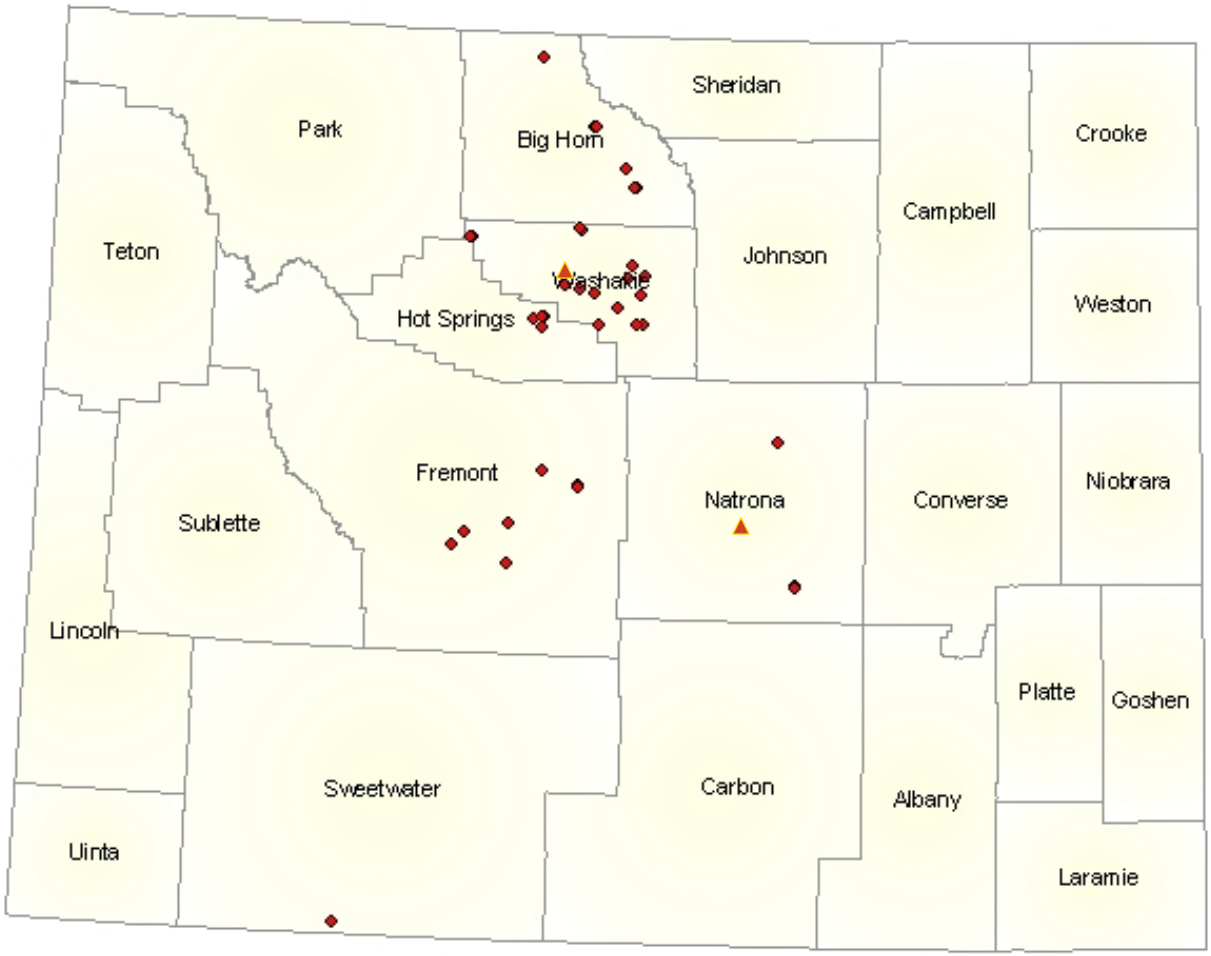
exclosures without Brte



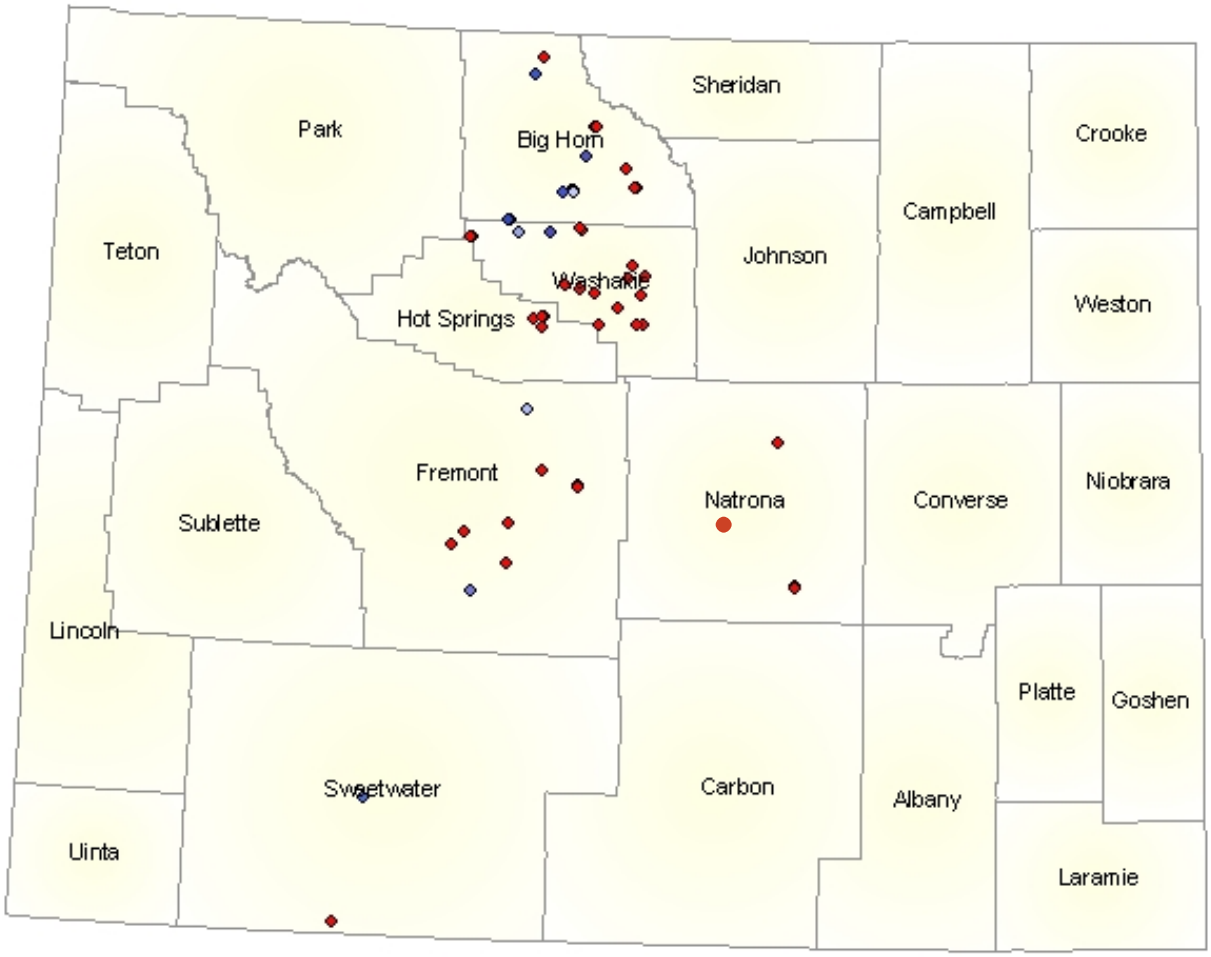
Cheatgrass when established



Exclosures with cheatgrass today



Exclosures with at least one exotic



New Records

- Revisited 85 exclosures
- Of these, 41 have weed species present today
- 6 had Cheatgrass when established (1953-1963)
- Today, 30 have Cheatgrass
- increased shrub cover

Cheatgrass and shrub interactions

- Shrubs may enhance establishment
  - microsite
  - fertility
  - balance with understory native species

Shrub canopy and interspaces

microsites and fertility:

grass: moderate

bare ground: lowest

shrub: highest fertility

Cheatgrass and shrub cover?

Future questions:

- Will cheatgrass in Wyoming have same impact as in Great Basin?
- How does structure of shrub populations change with removed grazing?
- Is shrub cover a contributor to cheatgrass success?

Thanks for listening!